DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terminology "enabling" could mean that the program does not actually carry out the method of claim 1, but rather enables something else to carry out the method.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 1 (and by virtue of their dependency, **claims 2 – 12**) are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory “process” under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject

matter (such as an article or material) to a different state or thing (Reference the May 15, 2008 memorandum issued by Deputy Commissioner for Patent Examining Policy, John J. Love, titled "Clarification of 'Processes' under 35 U.S.C. 101" – publicly available at USPTO.GOV, "memorandum to examining corp"). The instant claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. In order for a process to be "tied" to another statutory category, the structure of another statutory category should be positively recited in a step or steps significant to the basic inventive concept, and NOT just in association with statements of intended use or purpose, insignificant pre or post solution activity, or implicitly.

Claims 13 and 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 13 and 14 are drawn to functional descriptive material NOT claimed as residing on a computer readable medium. MPEP 2106.IV.B.1(a) (Functional Descriptive Material) states:

"Data structures not claimed as embodied in a computer-readable medium are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer."

"Such claimed data structures do not define any structural or functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized."

Claims 13 and 14, while defining a computer program, do not define a "computer-readable medium" and is thus non-statutory for that reasons. A computer program can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" in order to make the claim statutory.

"In contrast, a claimed computer-readable medium encoded with the data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory." - MPEP 2106.IV.B.1(a)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5, 6, 8, 11, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prakash et al. (US 2002/0131639 A1).

In regard to claim 1, Prakash et al. disclose a method of object processing (object based image processing, [0002]) for at least one image (image, [0006]) comprising the steps of: detecting a plurality of image points associated with at

least one object of the at least one image (detect trivalent point at the intersection of several objects, [0025], multiple trivalent points, [0025]); grouping the plurality of image points into at least a group of object points (adjacent image segments, [0036]) and a group of junction points (junction identifier, [0032]); and individually processing the image points of the group of object points (nothing is done to the adjacent image segments) and the group of junction points (extend an edge by extending from the starting (junction) point, [0032]-[0033]).

Prakash et al. do not explicitly describe grouping the image points into object points.

Prakash et al. indicate image segments, as shown in figure 4 and described in [0036]. It would be obvious at the time of the invention to one skilled in the art that points must have been grouped in order to form such a segment, as this is a logical manner to form a line segment.

In regard to claim 5, Prakash et al. disclose a method of object processing as claimed in claim 1. Prakash et al. further disclose the step of individually processing comprises applying a first process to the group of object points and applying a second process to the group of junction points, as only the junction points are extended out ([0032, [0033]), and the other points are just displayed ([0050]).

In regard to claim 6, Prakash et al. disclose a method of object processing as claimed in claim 5. Prakash et al. further disclose the first process is an object process based on object motion within the at least one image, in that motion results in an image uncovered region ([0021]), and the boundary areas that are not the junction areas adjacent to the uncovered region are just displayed ([0050]).

In regard to claim 8, Prakash et al. disclose a method of object processing as claimed in claim 5. Prakash et al. further disclose the second process is an object process based on a static characteristic within the at least one image (the points used to do the edge extension [second process] are the intersection/junction points, [0032]-[0033], applicants spec defines static information comes from the T-junction corresponding to the intersection between objects, US 2006/0251337 A1, [0010]).

In regard to claim 11, Prakash et al. disclose a method of object processing as claimed in claim 1, wherein the step of detecting the plurality of image points comprises applying a curvature detection process to at least a part of the at least one image (pixel locations of segment edges correspond to sharp color transitions, [0057]; Note: Applicant indicates detecting corner points based on curvature properties, i.e. on abrupt variations in a parameter such as brightness or colour, US 2006/0251337 A1, [0045]).

In regard to claim 12, Prakash et al. disclose a method of object processing as claimed in claim 1, wherein the junction points comprise T-junction points corresponding to an overlap between two objects of the at least one image ([0032]).

In regard to claim 15, based on publication of applicant's specification, US 2006/0251337 A1, the means for detecting a plurality of image points associated with at least one object of the at least one image; means for grouping the plurality of image points into at least a group of object points and a group of junction points; and means for individually processing the image points of the group of object points and the group of junction points are carried out in [0052]-[0057]. Because [0057] indicates the different processes may be performed by a single image processor, it indicates the structure necessary to perform the means are a detector to perform image detection and a processor that can group and process points.

Prakash et al. disclose an apparatus for object processing for at least one image ([0049]) comprising: means for detecting a plurality of image points associated with at least one object of the at least one image (encoder, transmit pixel locations, [0057]); means for grouping the plurality of image points into at least a group of object points and a group of junction points (manipulate image segments, encoder, [0050]-[0051]); and means for individually processing the

image points of the group of object points and the group of junction points (manipulate portions of frams, [0050], encoder, [0051]).

Claims 2, 3, 9, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prakash et al. (US 2002/0131639 A1) as applied to claim 1 above, in view of Berestov et al. (US 6714672 B1).

In regard to claim 2, Prakash et al. disclose a method of object processing as claimed in claim 1, and further disclose the hidden or occluded region behind the car becomes visible due to segment motion ([0021]), which implies 3D/depth information.

Prakash et al. do not explicitly disclose the step of individually processing comprises determining at least one three dimensional characteristic from at least one two dimensional image

Berestov et al. teach a process for determining a depth characteristic of at least one object of the at least one image (accurate depth map, col. 5, lines 25-30; topographical map, col. 5, lines 40-45; spatial relation between objects, col.12, lines 15-20).

Berestov et al. and Prakash et al. are in the same field of endeavor of processing overlapping images (Prakash et al., identify uncovered regions, abstract;

Berestov et al., detect image occlusion errors, abstract). It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the method of Berestov et al. for processing overlapping objects with the method of processing overlapping objects of Prakash et al., because the method of Berestov et al. allows the detection and elimination of occlusions and creates a depth map, without requiring significant time and effort.

In regard to claim 3, Prakash et al. disclose a method of object processing as claimed in claim 1. Prakash et al. do not disclose the plurality of image points are further grouped into a group of falsely detected points.

Berestov et al. teach a plurality of image points are further grouped into a group of falsely detected points (col. 6, lines 35-40).

In regard to claim 9, Prakash et al. disclose a method of object processing as claimed in claim 5. Prakash et al. do not explicitly disclose the second process is a process for determining a depth characteristic of at least one object of the at least one image.

Berestov et al. teach a process for determining a depth characteristic of at least one object of the at least one image (accurate depth map, col. 5, lines 25-30; topographical map, col. 5, lines 40-45; spatial relation between objects, col.12, lines 15-20).

In regard to claim 10, Prakash et al. and Berestov et al. disclose a method of object processing as claimed in claim 9. Berestov et al. further teach the depth characteristic is a relative depth characteristic indicating a relative depth between a plurality of objects of the at least one image (relative spatial locations between objects, 3D topographical information, col. 3, lines 35-40; spatial relationship between objects, col. 12, lines 15-20).

In regard to claim 13, Prakash et al. disclose a method of object processing as claimed in claim 1. Prakash et al. do not disclose a computer program enabling the carrying out of a method according to claim 1.

Berestov et al. teach a computer program that is enabled to carry out the image processing operations (Col. 9, lines 25-35).

In regard to claim 14, Prakash et al. and Berestov et al. disclose a computer program as claimed in claim 13. Berestov et al. further teach a record carrier (col. 9, lines 25-35).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prakash et al. (US 2002/0131639 A1) and Berestov et al. (US 6714672 B1) as applied to claim 3 above, and further in view of Kuo et al. (US 6618439 B1).

In regard to claim 4, Prakash et al. and Berestov et al. disclose a method of object processing as claimed in claim 3.

Prakash et al. and Berestov et al. do not teach each of the plurality of image points is included in only one group selected from the group of object points, the group of junction points and the group of falsely detected points.

Kuo et al. teach Standard MCI classifies each pixel inside a frame image into one of four classes: Moving Object (MO), Stationary Background (SB), Covered Background (CB) and Uncovered Background (UB) in which the four classes are mutually exclusive (col. 4, lines 45-55).

It would be obvious at the time of the invention to one of ordinary skill in the art to combine the method of Kuo et al. with the method of Prakash et al. and Berestov et al., because removing occlusion points as described by Berestov et al. would be improved by accurately and uniquely grouping the points. This combination of Kuo would have the predictable and desirable result when removing the erroneous points as described by Berestov et al., because by uniquely clustering the points as described by Kuo et al., only the correct groups of pixels are affected.

Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Prakash et al. (US 2002/0131639 A1) as applied to claim 5 above, and further in view of Applicant's Admitted Prior Art (AAPA, US 2006/0251337 A1).

In regard to claim 7, Prakash et al. disclose a method of object processing as claimed in claim 5. Prakash et al. further disclose the uncovered region is created by object motion ([0021]), and the display of these surrounding regions depends on how much is left covered and how much is uncovered ([0041]).

Prakash et al. do not define the first process is a structure from motion process per se.

AAPA teaches a structure from motion process is known in the prior art ([0007]).

It would be obvious at the time of the invention to one skilled in the art to define the structure from motion process as taught by the AAPA with the processes of Prakash et al. because a spatial relationship is implied by the uncovering process as disclosed by Prakash et al., that better describes depth relationships when taken in conjunction with AAPA.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Varekamp et al. (US 2006/0078156 A1)
- Nichani (US 6701005 B1)
- Wittenbrink et al. (US 6961469 B2)
- Mori et al. (US 6704018 B1)
- DeYoung et al. (US 6650770 B2)
- Katayama et al. (US 2003/0206653 A1)
- Knopp (US 6757445 B1)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELLE ENTEZARI whose telephone number is (571)270-5084. The examiner can normally be reached on M-Th, 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571)272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-270-6084.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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